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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025

EXAMINER	
WU, JINGGE	
ART UNIT	PAPER NUMBER
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/470,741	JIANG ET AL.	
	Examiner	Art Unit	
	Jingge Wu	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-9,11-21 and 23-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-9,11-21 and 23-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The request filed on August 27, 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/470,741 is acceptable and a CPA has been established. An action on the CPA follows.

2. Applicants' preliminary amendment to the last Office Action, filed August 27, 2002 has been entered and made of record.

3. Applicants' amendment has required new grounds of rejection. New grounds rejection are therefore presented in the Office Action.

4. Applicant's arguments have been fully considered but are moot in view of the new ground(s) of rejection. The Examiner would like to point out that regarding to the argument of "performing of the motion compensation comprising scaling motion vectors in accordance with a down sampling ration", the paragraph 5 of final rejection and advisory action all addressed the issue.

5. There is no PTO 1449 filed on September 7, 2001 in the file. Applicant needs to mail or fax the PTO 1449 again in order to be considered.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-7, 9, 11-12, 16-19, 21-24, 28-30 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Frequency domain down-

conversion of HDTV using an optimal motion compensation scheme" to Vetro et al. ("Vetro" a refernce of the record). Vetro in view of US5262854 to Ng (a reference of the record) and US 6215822 to Bose et al.

As to claim 1, Vetro discloses a method of performing video image decoding comprising:

downsampling (down-conversion) a compressed video image in the frequency domain (DCT domain) (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2);

inverse transforming (IDCT) the downsampled video image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2 and pages 11, section 4.3).

Vetro further discloses downscaling the motion vector (pages 10-12) but does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Ng in the method of Vetro in order to improve the image reconstruction accuracy (Ng, col. 6 lines 8-45, Vetro, abstract).

Doing so would convert the format of the motion vector so as to improve accuracy of image reconstruction so that the quality of the method is improved.

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, explicitly teaches limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

As to claim 16, Vetro discloses a method of performing video image decoding comprising:

inverse transforming (IDCT) the a compressed video image (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2);

downsampling (down-conversion) a compressed video image in the spatial domain (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2, and page 11, section 4.3).

Vetro further discloses downscaling the motion vector (pages 10-12) but does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

Analogous argument is addressed with respect to claim 1.

As to claims 2 and 17, Vetro further discloses wherein the compressed video image in the frequency domain comprises a discrete cosine transform image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2).

As to claims 3 and 18, Vetro further discloses the DCT image is stored as complying with an MPEG specification(Abstract, note that the DCT image of Vetro is inherently stored as MPEG because the Vetro method is to solve the drift and block artifact problems of MPEG-2).

As to claim 4, Vetro further discloses the DCT image is stored as a frame type image (Fig. 8 , scheme 1, page 9, section 4.1).

As to claim 5, Vetro further discloses the motion compensation data signals are stored as frame prediction type motion compensation (page 11, section 4.3).

As to claim 6, Vetro further discloses the DCT image is stored as a field type image (Fig. 9 , scheme 1, page 10, section 4.2).

As to claim 19, all elements are addressed with regard to claims 4 and 6.

As to claims 7 and 21, Vetro further discloses the motion compensation data signals are stored as field prediction type motion compensation (page 11, section 4.3).

As to claim 9, Vetro further discloses the downsampling is performed using an integer ratio(Fig. 6, page 6, note that 16x16 DCT macroblock is down-conversion to 8x8 DCT macroblock and the ratio is 2).

As to claim 22, Vetro further discloses the step of performing motion compensation comprises scaling motion vectors in according with a downscaling ratio (Fig. 3b, page 4-5, section 2, note that the downconversion spatial filter x is inherently of a downscaling ratio).

As to claim 23, Vetro further discloses wherein motion vector compensation comprises implementing an interpolation operation (Fig. 3b, page 4, section 2, and page 11, section 4.3 note that equation (1) is an interpolation operation).

As to claim 24, Vetro further discloses motion compensation scaling implementing a bilinear interpolation operation (page 12, note that 4x4 cut with bilinear interpolation).

As to claims 11-12, the discussions are addressed with regard to claims 22-23, respectively.

As to claim 28, Vetro discloses elements such as downsampling in frequency domain, inverse transforming, and motion compensation (the discussions are addressed with regard to claims 1-3, respectively) but does not explicitly mention an

article comprising: a storage medium, having stored thereon instructions, that when execute by a platform and scaling motion vectors in according to a downsampling ratio.

Ng, in an analogous environment, discloses an article result in following : a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the controller 302, as a state machine, is inherently to have a storage medium storing the program (instructions) executed by a platform because of the programmed routines), and performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Ng in the method of Vetro in order to improve the image reconstruction accuracy (Ng, col. 6 lines 8-45, Vetro, abstract). Doing so would convert the format of the motion vector so as to improve accuracy of image reconstruction so that the quality of the method is improved.

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

As to claims 29-30, the discussions are addressed with regard to claims 2-3, respectively.

As to claim 32, Vetro discloses elements such as downsampling in spatial domain, inverse transforming, and motion compensation (the discussions are addressed with regard to claim 16) but does not explicitly mention an article result in following: a storage medium, having stored thereon instructions, that when execute by a platform and does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the controller 302, as a state machine, is inherently to have a storage medium storing the program (instructions) executed by a platform because of the programmed routines), and performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

An analogous argument with regard to combining Vetro and Ng is addressed with regard to claim 28.

As to claims 33-34, the discussions are addressed with regard to claims 2-3, respectively.

8. Claims 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro, Bose and Ng in view of the article "A fast scheme for altering resolution in the compressed domain" to Dugad et al. ("Dugad" a reference of the record).

As to claims 14 and 26, Vetro further discloses the downsampling comprises implemented a linear filter (Page 5, equation 6 and 7) but does not explicitly mention the bilinear interpolation which is well known in the art.

Dugad, in an analogous environment, discloses using the well known bilinear interpolation scheme for downsampling (Fig. 3, page 216, section 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Dugad in the method of Vetro in order to decrease the computational burden and directly downsample in compression domain (Dugad, page 213, section 1). Doing so would utilize the linear property of DCT transform so as to decrease the computational time so that the efficiency of the method is improved.

9. Claims 8 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro and Ng., further in view of US 6175592 to Kim ("Kim" a reference of the record).

As to claim 8, the combination of Vetro and Ng does not mention displaying downsampled spatial image that appear substantially uniform on a computer monitor.

Kim, in an analogous environment, discloses displaying the downsampled spatial image so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation) that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b, col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical interpolation, especially for even/odd field, creates uniform downsampled image in vertical direction).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Kim in a computer monitor in the method of Vetro in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-

27). Doing so would create substantial uniform downsample image in raster format to display on the screen in a computer monitor by the vertical interpolation so that the quality of the method is improved.

As to claim 31, the combination of Vetro and Ng does not mention displaying downsampled spatial image that appear substantially uniform on a computer monitor.

Kim, in an analogous environment, discloses displaying the downsampled spatial image so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation) that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b, col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical interpolation, especially for even/odd field, creates uniform downsampled image in vertical direction).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Kim in a computer monitor in the method of Vetro and Ng in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-27). Doing so would create substantial uniform downsample image in raster format to display on the screen in a computer monitor by the vertical interpolation so that the quality of the method is improved.

10. Claims 15 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vetro, Ng, Bose and Dugad, further in view of US 6222550 to Rosman et al. ("Rosman" a reference of the record).

As to claims 25 and 27, the combination Vetro, Ng, Boses and Dugad discloses bilinear interpolation but does not mention 3D pipeline which is well known in the art.

Rosman, in an analogous environment, discloses using 3D pipeline to perform the bilinear interpolation (Fig. 3, col. 1, lines 8-9, col. 12, lines 5-27).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the pipeline scheme of Rosman in the method of Vetro and Dugad in order to increase computing speed and performance (Rosman, col. 1 lines 38-42 and col. 11, lines 7-44). Doing so would increase the computing speed for the bilinear interpolation by using the 3D pipeline so that the efficiency of the method is improved.

Contact Information

Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Primary Patent Examiner